

ABSTRACT OF THE DISCLOSURE

A method of manufacturing a thin film electrochemical apparatus is disclosed. A near net shape ceramic element is molded including a planar base region and a plurality of tubular regions. The planar base region is infiltrated with  
5 a non-conductive material. Each of the tubular regions is infiltrated with a porous conductive material. A porous catalytic electrode material is applied onto the infiltrated regions to form one of a cathodic and anodic surface. A ceramic electrolyte coating is deposited onto the porous catalytic electrode material. A porous catalytic electrode material is applied onto the deposited ceramic  
10 electrolyte coating. A porous conductive material is deposited onto the porous catalytic electrode to form the other of the cathodic and anodic surface.